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Attorney's Docket No. 0023-0165

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In re Patent Application of )  
Pradeep SINDHU et al. ) Group Art Unit: 2667  
Application No.: 09/448,124 ) Examiner: K. Yao  
Filed: November 24, 1999 )  
For: A SWITCHING DEVICE )

**TRANSMITTAL FOR APPEAL BRIEF**

U.S. Patent and Trademark Office  
Customer Service Window, Mail Stop Appeal Brief-Patents  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Sir:

Transmitted herewith is an Appeal Brief in support of the Notice of Appeal filed  
November 21, 2005.

Enclosed is a check for ☐ \$250.00 ☒ \$500.00 to cover the Government fee.

The Commissioner is hereby authorized to charge any other appropriate fees that may be  
required by this paper that are not accounted for above, and to credit any overpayment, to  
Deposit Account No. 50-1070.

Respectfully submitted,

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**CUSTOMER NUMBER: 44987**

Date: January 12, 2006



PATENT  
Docket No. 0023-0165

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:	)	
	)	
Pradeep SINDHU et al.	)	
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Serial No.: 09/448,124	)	Group Art Unit: 2667
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**APPEAL BRIEF**

This Appeal Brief is submitted in response to the final Office Action, dated August 23, 2005, and in support of the Notice of Appeal, filed November 21, 2005.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Juniper Networks, Inc.

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

Appellants are unaware of any related appeals, interferences or judicial proceedings.

III. STATUS OF CLAIMS

Claims 44-87 are pending in this application.

Claim 80 has been finally rejected under 35 U.S.C. § 112, second paragraph, for allegedly failing to appropriately define the invention.

Claim 85 has been finally rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite.

Claims 44-49, 68-70, 80-84, and 86 have been finally rejected under 35 U.S.C. § 102(e) as allegedly anticipated by McKeown et al. (U.S. Patent No. 6,647,019).

Claims 51, 52, 54, 56, 58, 66, 67, 73, and 78 have been finally rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over McKeown et al. in view of Stevens (U.S. Patent No. 5,463,486).

Claims 50, 71, 72, and 87 have been finally rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over McKeown et al. in view of Cisneros (U.S. Patent No. 5,157,654).

Claim 85 has been identified as allowable if rewritten to overcome the rejection under 35 U.S.C. § 112, second paragraph.

Claims 53, 55, 57, 59-65, 74-77, and 79 have been objected to as dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the features of the base claim and any intervening claims.

Claims 44-52, 54, 56, 58, 66-73, 78, 80-84, 86, and 87 are the subject of the present appeal. These claims are reproduced in the Claim Appendix of this Appeal Brief.

#### IV. STATUS OF AMENDMENTS

An Amendment was filed subsequent to the final Office Action. The Examiner issued an

Advisory Action that indicated that the Amendment overcomes the rejection of claim 85 under 35 U.S.C. § 112, second paragraph, and would be entered upon the filing of an appeal.

V. SUMMARY OF CLAIMED SUBJECT MATTER

In the paragraphs that follow, each of the independent claims and the claims reciting means-plus-function or step-plus-function language that is involved in this appeal will be recited followed in parenthesis by examples of where support can be found in the specification and drawings.

Claim 44 recites that in a system (30) for transferring data packets, where the system (30) includes a plurality of line cards (58, 66), a line card (58, 66) comprises a request generator (78) to generate a request signal to be transmitted to a destination line card (66) in order to receive a grant signal authorizing transferring of data to the destination line card (66) (page 12, line 32 - page 13, line 20; page 16, lines 26-28, page 17, line 13 - page 18, line 2); a data cell transmitter (82) to transmit a data cell to the destination line card (66) upon receipt of the grant signal from the destination line card (66) (page 12, line 32 - page 13, line 20; page 16, lines 28-29, page 19, lines 3-22); and transmit logic (84) to receive a grant signal and a data cell which are unrelated to each other from a grant generator (80) and the data cell transmitter (82), respectively, and transmit the grant signal and the data cell together in a data transfer unit (page 16, lines 30-32; page 19, lines 23-29; page 20, lines 9-17).

Claim 45 recites a switching device (30) for transferring data packets, comprising one or more source line cards (58), each including a request generator (78) to generate a request signal to be transmitted in order to obtain an authorization to transmit data (page 12, line 32 - page 13,

line 20; page 16, lines 26-28, page 17, line 13 - page 18, line 2); one or more destination line cards (66), each including a grant generator (80) to generate and send back a grant signal to a source line card (58) in response to the request signal received at a destination line card (66) to authorize the source line card (58) to transmit a data cell to the destination line card (66) (page 12, line 32 - page 13, line 20; page 18, line 17 - page 19, line 2); and a switching fabric (54) coupled to the source line card (58) and the destination line card (66) (Fig. 2), the switching fabric (54) being configured to receive and transmit the request signal, the grant signal, and the data cell to the appropriate line cards (58, 66) (page 32, line 31 - page 36, line 4), where the switching fabric (54) is configured to transmit at least two of a request signal, a grant signal, or a data cell together in a single data transfer unit (page 15, lines 5-21).

Claim 67 recites that in a switching device (30) having a plurality of line cards (58, 66) and a switch fabric (54) therebetween for transferring data packets, a switch fabric (54) comprises a plurality of first stage crossbars (60) in a first stage (F1), each first stage crossbar (60) having a plurality of input ports (61) and a plurality of output ports (63), each input port (61) having a first request spray engine (132) to receive a plurality of request signals associated with a destination line card (66) and spray the request signals to different ones of the output ports (63) in the same first stage crossbar (60) (page 33, lines 11-20); a plurality of second stage crossbars (62) in a second stage (F2), each second stage crossbar (62) having a plurality of input ports (61) and a plurality of output ports (63), each input port (61) having a second request spray engine (132) to receive one of the request signals from one of the first stage crossbars (60) and send the request signal to one of the output ports (63) in the same second stage crossbar (62) (page 33, line 25 - page 34, line 4); and a plurality of third stage crossbars (64) in a third stage (F3), each

third stage crossbar (64) having a plurality of input ports (61) and a plurality of output ports (63), each input port (61) having a third request spray engine (132) to receive one of the request signals from one of the second stage crossbars (62) and send the request signal to one of the output ports (63) in the same third stage crossbar (64) (page 34, lines 5-10).

Claim 68 recites that in a switching device (30) for transferring data packets wherein the switching device (30) includes a plurality of line cards (58, 66), a line card (58, 66) comprises a request generator (78) to generate a request signal to be transmitted to a destination line card (66) in order to receive a grant signal authorizing transferring of data to the destination line card (66) (page 12, line 32 - page 13, line 20; page 16, lines 26-28, page 17, line 13 - page 18, line 2); and a data cell transmitter (82) to provide a data cell to be transmitted to the destination line card (66) upon receipt of the grant signal from the destination line card (66) (page 12, line 32 - page 13, line 20; page 16, lines 28-29, page 19, lines 3-22), where a request signal and a data cell are transmitted together in a single data transfer unit (page 16, lines 30-32; page 20, lines 9-17).

Claim 69 recites a switching device (30) for transferring data, comprising a source line card (58); a destination line card (66) including a grant generator (80) to generate and transmit a grant signal to the source line card (58) to authorize the source line card (58) to transfer data to the destination line card (66) (page 12, line 32 - page 13, line 20; page 18, line 17 - page 19, line 2); the source line card (58) including a data cell transmitter (82) to transfer a data cell to the destination line card (66) upon receiving the grant signal at the source line card (58) (page 12, line 32 - page 13, line 20; page 16, lines 28-29, page 19, lines 3-22); and a switching fabric (54) coupled to the source line card (58) and the destination line card (66) for receiving the grant signal from the destination line card (66) and switching the grant signal to the source line card

(58) (page 34, lines 18-26), and for receiving the data cell from the source line card (58) and switching the data cell to the destination line card (66) (page 34, line 27 - page 19), where the switching fabric (54) is configured to transmit a grant signal and a data cell together in a single data transfer unit (page 15, lines 5-21).

Claim 70 recites a method for transferring data between line cards (58, 66) in a router (30), the router (30) having a plurality of line cards (58, 66) and a switching fabric (54) coupled to the line cards (58, 66), the method comprising transmitting a request signal from a source line card (58) to a destination line card (66) through the switching fabric (54) (page 13, lines 8-10); upon receiving the request signal at the destination line card (66), sending a grant signal from the destination line card (66) to the source line card (58) responsive to the request signal to authorize the source line card (58) to transfer data to the destination line card (66) (page 13, lines 12-18); transferring a data cell from the source line card (58) to the destination line card (66) in response to the grant signal received at the source line card (58) (page 13, lines 18-20); and transferring, by the switching fabric (54), at least two of a request signal, a grant signal, or a data cell together in a single data transfer unit (page 15, lines 5-21).

Claim 80 recites that in a switching device (30) having a plurality of line cards (58, 66) and a switch fabric (54) therebetween for transferring data packets, a method for controlling the transfer of data packets through the switching device (54) comprises transferring data packets and flow control together on a same path through the switching device (54) (page 12, lines 5-14; page 32, line 31 - page 36, line 4).

Claim 81 recites that in a switching device (30) having a plurality of line cards (58, 66) and a switching fabric (54) therebetween for transferring data packets, where each line card (58,

66) includes an input section including one or more input ports and an output section including one or more output ports (page 16, lines 19-22), a method for controlling the transfer of a data packet through the switching device (30) comprises generating a request flow control message at a source line card (58) to request authorization for a transfer of the data packet from the source line card (58) to the destination line card (66) (page 13, lines 2-10; page 16, lines 19-28); transferring the request flow control message from the input section of the source line card (58) to the output section of the destination line card (66) using the switching fabric (54) (page 32, line 31 - page 34, line 10); generating a grant flow control message at a destination line card (66) for the data packet (page 13, lines 12-18; page 18, lines 17-21); transferring the grant flow control message from the output section of the destination line card (66) to the input section of the destination line card (66) (page 18, lines 17-28); transferring the grant flow control message from the input section of the destination line card (66) to the output section of the source line card (58) using the switching fabric (54) (page 34, lines 11-26); receiving the grant flow control message on the output section of the source line card (58) and transferring the grant flow control message to the input section of the source line card (58) (page 19, lines 12-22); and upon receipt of the grant flow control message at the input section of the source line card (58), transferring the data packet from the source line card (58) to the destination line card (66) using the switching fabric (54) (page 19, lines 12-22; page 34, line 27 - page 35, line 19).

Claim 82 recites that in a switching device (30) having a plurality of line cards (58, 66) and a switching fabric (54) therebetween for transferring data packets, where each line card (58, 66) includes an input section including one or more input ports and an output section including one or more output ports (page 16, lines 19-22), a method for controlling the transfer of a data



packet through the switching device (30) comprises generating flow control messages at the source line card (58) and destination line card (66) to authorize a transfer of the data packet from the source line card (58) to the destination line card (66) (page 13, lines 2-18; page 16, lines 19-28; page 18, lines 17-21); and transferring the flow control messages between the source and destination line cards (58, 66) including transferring flow control messages from the input section of a line card (58, 66) to the output section of a different line card (58, 66) using the switching fabric (54) (page 32, line 31 - page 34, line 10), and transferring flow control messages from the output section of a line card (58, 66) to the input section of a same line card (58, 66) without using the switching fabric (54) (page 19, lines 12-22).

Claim 83 recites that in a switching device (30) having a plurality of line cards (58, 66) and a switching fabric (54) therebetween for transferring data packets, a method for controlling the transfer of a data packet through the switching device (30) comprises generating flow control messages at the source line card (58) and destination line card (66) to authorize a transfer of the data packet from the source line card (58) to the destination line card (66) (page 13, lines 2-18; page 16, lines 19-28; page 18, lines 17-21), each flow control message only including a source and destination line card address (page 9, lines 7-9; page 17, line 32 - page 18, line 2; page 20, lines 7-8); and transferring the flow control messages between the source and destination line cards (58, 66) using the switching fabric (54) where minimal data buffering is performed by the switching fabric (54) in processing the flow control messages (page 8, line 23 - page 9, line 6; page 13, lines 8-18).

Claim 86 recites a switching device (30) for transferring data packets comprising one or more source line cards (58), each including a request generator (78) to generate a request signal

to be transmitted in order to obtain an authorization to transmit data (page 12, line 32 - page 13, line 20; page 16, lines 26-28, page 17, line 13 - page 18, line 2); one or more destination line cards (66), each including a grant generator (80) to generate and send back a grant signal to a source line card (58) in response to the request signal received at the destination line card (66) to authorize the source line card (58) to transmit a data cell to the destination line card (66) (page 12, line 32 - page 13, line 20; page 18, line 17 - page 19, line 2)); and a plurality of planes of switching elements (54) coupling the one or more source line cards (58) and the one or more destination line cards (66) (Fig. 14), each plane being connected to the one or more source line cards (58) and the one or more destination line cards (66) and being configured to receive and transmit the request signal, the grant signal, and the data cell to the appropriate line cards (page 32, line 31 - page 36, line 4).

Claim 87 recites that in a switching device (30) including one or more source line cards (58) and destination line cards (66), the switching device (30) for transferring data packets through a network, a method for recovering from a failure in the switching device (30) comprising providing plural switching planes between each source line card (58) and destination line card (66) (Fig. 14); generating flow control messages for authorizing a transfer of a packet from a source line card (58) to a destination line card (66) (page 13, lines 8-18); spraying the flow control messages over each of the plural switching planes (page 33, lines 4-7; page 34, lines 11-17); and spraying data packets over switching planes on which flow control authorization messages are received (page 34, line 27 - page 35, line 4).

## VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

A. Claim 80 stands rejected under 35 U.S.C. § 112, second paragraph, as failing to appropriately define the invention.

B. Claims 44-49, 68-70, 80-84, and 86 stand rejected under 35 U.S.C. § 102(e) as anticipated by McKeown et al.

C. Claims 51, 52, 54, 56, 58, 66, 67, 73, and 78 stand rejected under 35 U.S.C. § 103(a) as unpatentable over McKeown et al. in view of Stevens.

D. Claims 50, 71, 72, and 87 stand rejected under 35 U.S.C. § 103(a) as unpatentable over McKeown et al. in view of Cisneros.

## VII. ARGUMENT

### A. **Rejection Under 35 U.S.C. § 112, Second Paragraph.**

The initial burden of establishing a prima facie basis to deny patentability to a claimed invention is always upon the Examiner. In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). 35 U.S.C. § 112, second paragraph, requires that the specification conclude with one or more claims particularly pointing out and distinctly claiming the subject matter that the Appellants regard as their invention.

#### 1. Claim 80.

Independent claim 80 is directed to a method for controlling the transfer of data packets through a switching device. Claim 80 recites the act of transferring data packets and flow control together on a same path through the switching device.

The Examiner alleged that claim 80 is narrative in form and does not contain any positively recited steps of a specific process. Final Office Action, page 2. Appellants submit that

the Examiner's allegation lacks merit. The act of transferring data packets and flow control together on a same path through the switching device is positively recited to define the method of claim 80.

For at least these reasons, it is respectfully submitted that claim 80 is particularly pointed out and distinctly claimed, as required by 35 U.S.C. § 112, second paragraph. Reversal of the rejection of claim 80 is respectfully requested.

**B. Rejection Under 35 U.S.C. § 102(e) Over McKeown et al. (U.S. Patent No. 6,647,019).**

The initial burden of establishing a prima facie basis to deny patentability to a claimed invention is always upon the Examiner. In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). For a proper rejection under 35 U.S.C. § 102, each and every element as set forth in the claim must be found, either expressly or inherently, in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987). Prior legal precedent requires that the identical invention be shown in as complete detail as is contained in the claim. Richardson v. Suzuki Motor Co., 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989).

1. Claim 44.

Independent claim 44 is directed to a line card in a system for transferring data packets, where the system includes a plurality of line cards. The line card comprises a request generator to generate a request signal to be transmitted to a destination line card in order to receive a grant signal authorizing transferring of data to the destination line card; a data cell transmitter to transmit a data cell to the destination line card upon receipt of the grant signal from the

destination line card; and transmit logic to receive a grant signal and a data cell which are unrelated to each other from a grant generator and the data cell transmitter, respectively, and transmit the grant signal and the data cell together in a data transfer unit.

McKeown et al. does not disclose or suggest the combination of features recited in claim 44. For example, McKeown et al. does not disclose or suggest a request generator, of a line card, to generate a request signal to be transmitted to a destination line card in order to receive a grant signal authorizing transferring of data to the destination line card.

The Examiner alleged that McKeown et al. discloses a request generator to generate a request signal (Fig. 7) to be transmitted to a destination line card (Fig. 3, line card 330z) in order to receive a grant signal (Fig. 8) authorizing transferring of data to the destination line card (Fig. 3, line card 330z). Final Office Action, page 3. Appellants respectfully disagree.

McKeown et al. discloses:

The LCS-2 protocol utilizes three Phases to transmit an LCS-2 cell from linecard 330 to port module 340: a Request Phase, a Grant Phase and a Transmit Phase. When linecard 330a has received data that requires routing to an egress linecard (e.g. 330z), linecard 330a relies upon the Request Phase to alert port module 340a that data is pending at linecard 330a. When ingress port module 340a is ready to receive this data, port module 340a relies upon the Grant Phase to inform linecard 330a that the port module 340a is ready to receive cell data. Upon receiving such readiness information from port module 340a, linecard 330a relies upon the Transmit Phase to transmit cell data to port module 340a.

(col. 11, lines 37-49). In other words, McKeown et al. discloses that line card 330a transmits a request to port module 340a of switch core 320 (Fig. 3) and receives a grant from port module 340a when port module 340a is ready to receive the data. Nowhere does McKeown et al. disclose or suggest a request signal to be transmitted to a destination line card in order to receive a grant signal authorizing transferring of data to the destination line card, as required by claim 44. Instead, as explained above, McKeown et al. discloses that the line card sends a request signal to

the switch core. McKeown et al. does not disclose or suggest that the request signal is transmitted to the destination line card.

McKeown et al. also does not disclose or suggest a data cell transmitter to transmit a data cell to the destination line card upon receipt of the grant signal from the destination line card, as further recited in claim 44.

The Examiner alleged that McKeown et al. discloses a data cell transmitter to transmit a data cell to the destination line card (Fig. 3, line card 330z) upon receipt of the grant signal (Fig. 8) from the destination line card. Final Office Action, page 3. Appellants respectfully disagree.

At column 11, lines 37-49, McKeown et al. discloses that line card 330a receives a grant from port module 340a of switch core 320 (Fig. 3) when port module 340a is ready to receive the data from line card 330a. Nowhere does McKeown et al. disclose or suggest a data cell transmitter to transmit a data cell to a destination line card upon receipt of a grant signal from the destination line card, as required by claim 44. Instead, as explained above, McKeown et al. discloses that the switch core generates and transmits a grant cell to the line card.

McKeown et al. also does not disclose or suggest transmit logic to receive a grant signal and a data cell which are unrelated to each other from a grant generator and the data cell transmitter, respectively, and transmit the grant signal and the data cell together in a data transfer unit, as further recited in claim 44.

The Examiner alleged that McKeown et al. discloses transmit logic to receive a grant signal (Fig. 8) and a data cell which are unrelated (col. 13, lines 23-28 and 49-52) to each other from a grant generator and the data cell transmitter, respectively, and transmit the grant signal (Fig. 8) and the data cell together in a data transfer unit (col. 13, lines 12-64). Final Office

Action, page 3. Appellants respectfully disagree.

At column 13, lines 12-64, McKeown et al. discloses:

To illustrate the LCS-2 protocol scheme in packet-switch system 300, FIG. 5 illustrates a high level schematic of the Request Phase, Grant Phase and Transmit Phase, which results in the transmission of a unicast LCS-2 data cell (an LCS-2 request cell, which contains cell data that is the focus of this illustrative example within the Cell Data field), from ingress linecard 330a to port module 340a. The Request Phase is initiated when linecard 330a transmits an LCS-2 request cell, which identifies that linecard 330a is ready to transmit cell data to port module 340a. The Label\_1 field within this LCS-2 request cell identifies to which flow the requested LCS-2 request cell belongs. The Cell Data field, which is included within this LCS-2 request cell, does not correspond to the cell data that is currently ready to be transmitted, but rather relates to a previous cell data that has been pending within the linecard 330a, which has been granted permission to be transmitted to the port module 340a. The cell data, which is ready for transmission and which has triggered this current Request Phase, will be incorporated into a subsequent LCS-2 request cell, which will be later identified as the LCS-2 data cell.

When port module 340a receives the LCS-2 request cell, port module 340a stores the request (field) until port module 340a is ready to receive the cell data from linecard 330a. The details of how and when the Grant Phase, corresponding to granting the request of the linecard 330a, is initiated is specific to each implementation of packet-switch system 300. In a preferred embodiment, scheduler module 360 examines all requests within each port module 340 of system 300 and selects and triggers the Grant Phase for specific requests that are stored within one of more of these port modules 340. Once port module 340a is triggered to initiate the Grant Phase for a specific request, port module 340a transmits an LCS-2 grant cell to linecard 330a to signal linecard 330a that port module 340a is ready to receive the cell data corresponding to the request. The Grant field of this LCS-2 grant cell includes the same Label\_1 field as the original LCS-2 request cell. When ingress linecard 330a receives the LCS-2 grant cell, the Transmit Phase is initiated by linecard 330a including the cell data in the next LCS-2 request (data) cell, which is transmitted to port module 340a.

Since linecard 330a only transmits an LCS-2 data cell to port module 340a when port module 340a grants the linecard 330a permission to transmit the cell data, the amount of buffering required within port module 340a is even less than the amount of buffering required in an LCS-1-based system 300. For example, since the primary buffering within a port module 340a of an LCS-2-based system 300 is of request information, rather the cell data itself, less buffering is needed to store the smaller amounts of information. Therefore, the size of the switch core 320 of a system 300, which utilizes the LCS-2 protocol, can be further reduced in size.

In this section, McKeown et al. discloses that port module 340a transmits a grant cell to line card 330a to signal to line card 330a that port module 340a is ready to receive the cell data corresponding to the request sent by line card 330a. McKeown et al. discloses that the grant cell includes a header portion and a data portion (col. 12, lines 19-42). Nowhere does McKeown et al. disclose or suggest that line card 330a transmits the grant cell or that the grant cell includes a

grant signal and a data cell that are unrelated to each other, as required by claim 44.

For at least these reasons, it is respectfully submitted that claim 44 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 44 is respectfully requested.

2. Claim 45.

Independent claim 45 is directed to a switching device for transferring data packets. The switching device comprises one or more source line cards, each including a request generator to generate a request signal to be transmitted in order to obtain an authorization to transmit data; one or more destination line cards, each including a grant generator to generate and send back a grant signal to a source line card in response to the request signal received at a destination line card to authorize the source line card to transmit a data cell to the destination line card; and a switching fabric coupled to the source line card and the destination line card, the switching fabric being configured to receive and transmit the request signal, the grant signal, and the data cell to the appropriate line cards, where the switching fabric is configured to transmit at least two of a request signal, a grant signal, or a data cell together in a single data transfer unit.

McKeown et al. does not disclose or suggest the combination of features recited in claim 45. For example, McKeown et al. does not disclose or suggest one or more destination line cards, each including a grant generator to generate and send back a grant signal to a source line card in response to the request signal received at a destination line card to authorize the source line card to transmit a data cell to the destination line card.

The Examiner alleged that McKeown et al. discloses one or more destination line cards (Fig. 3, line card 330z), each including a grant generator to generate and send back a grant signal



(Fig. 8) to a source line card (Fig. 3, line card 330a) in response to the request signal (Fig. 7) received at a destination line card (Fig. 3, line card 330z) to authorize the source line card (Fig. 3, line card 330a) to transmit a data cell to the destination line card (Fig. 3, line card 330z). Final Office Action, page 4. Appellants respectfully disagree.

At column 11, lines 37-49, McKeown et al. discloses that when an ingress line card 330a has data to send to egress line card 330z, line card 330a sends a request cell to port module 340a of switch core 320 and when port module 340a is ready to receive the data, port module 340a sends a grant cell to line card 330a. Nowhere does McKeown et al. disclose or suggest that egress line card 330z generates and sends back a grant signal to source line card 330a in response to the request signal received at destination line card 330z to authorize source line card 330a to transmit a data cell to destination line card 330z, as required by claim 45. Instead, as explained above, McKeown et al. discloses that switch core 320, not destination line card 330z, generates and sends a grant cell to line card 330a.

McKeown et al. also does not disclose or suggest a switching fabric coupled to the source line card and the destination line card, the switching fabric being configured to receive and transmit the request signal, the grant signal, and the data cell to the appropriate line cards, where the switching fabric is configured to transmit at least two of a request signal, a grant signal, or a data cell together in a single data transfer unit, as recited in claim 45.

The Examiner alleged that McKeown et al. discloses a switching fabric (Fig. 3, switch core 320) coupled to the source line card (Fig. 3, line card 330a) and the destination line card (Fig. 3, line card 330z), the switching fabric (Fig. 3, switch core 320) being configured to receive and transmit the request signal (Fig. 7), the grant signal (Fig. 8), and the data cell to the

appropriate line cards (Fig. 3, line cards 330a, 330z), where the switching fabric (Fig. 3, switch core 320) is configured to transmit at least two of a request signal (Fig. 7), a grant signal (Fig. 8), or a data cell together in a single data transfer unit (col. 13, lines 12-64). Final Office Action, page 4. Appellants respectfully disagree.

Column 13, lines 12-64, of McKeown et al. is reproduced above. Nowhere in this section, or elsewhere, does McKeown et al. disclose or suggest, for example, that switch core 320 receives a grant signal or transmits a request signal, as required by claim 45. Instead, McKeown et al. discloses only that switch core 320 transmits a grant cell and receives a request cell (col. 13, lines 33-47).

For at least these reasons and reasons similar to those given with regard to claim 44, it is respectfully submitted that claim 45 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 45 is respectfully requested.

3. Claims 46 and 47.

Dependent claim 46 recites that the source line card further includes a data cell transmitter to transmit the data cell upon receiving the grant signal from the destination line card. Initially, claim 46 depends from claim 45 and is, therefore, not anticipated by McKeown et al. for at least the reasons that claim 45 is not anticipated.

Further, McKeown et al. does not disclose or suggest the combination of features recited in claim 46. For example, McKeown et al. does not disclose or suggest a source line card that includes a data cell transmitter to transmit a data cell upon receiving a grant signal from a destination line card.

The Examiner alleged that McKeown et al. discloses a source line card (Fig. 3, line card

330a) further includes a data cell transmitter to transmit the data cell upon receiving the grant signal (Fig. 8) from the destination line card (Fig. 3, line card 330z). Final Office Action, page 4. Appellants disagree. As explained above, McKeown et al. discloses that switch core 320, not destination line card 330z, generates and sends a grant cell to line card 330a (col. 11, lines 37-46). Therefore, contrary to the Examiner's allegation, McKeown et al. cannot disclose or suggest that line card 330a includes a data cell transmitter to transmit a data cell upon receiving a grant cell from line card 330z, as would be required by claim 46.

For at least these reasons, it is respectfully submitted that claim 46 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claims 46 and 47 is respectfully requested.

4. Claim 48.

Dependent claim 48 recites that the source line card further includes transmit logic to receive a grant signal and a data cell which are unrelated to each other from the grant generator and the data cell transmitter, respectively, and transmit the grant signal and the data cell together to the switching fabric. Initially, claim 48 depends from claim 46 and is, therefore, not anticipated by McKeown et al. for at least the reasons that claim 46 is not anticipated.

Further, McKeown et al. does not disclose or suggest the combination of features recited in claim 48. For example, McKeown et al. does not disclose or suggest a source line card that includes transmit logic to receive a grant signal and a data cell which are unrelated to each other from the grant generator and the data cell transmitter, respectively, and transmit the grant signal and the data cell together to the switching fabric.

The Examiner alleged that McKeown et al. discloses a source line card (Fig. 3, line card

330a) further includes transmit logic to receive a grant signal (Fig. 8) and a data cell which are unrelated (col. 13, lines 23-28 and 49-52) to each other from the grant generator and the data cell transmitter, respectively, and transmit the grant signal (Fig. 8) and the data cell together (col. 13, lines 12-64) to the switching fabric (Fig. 3, switch core 320). Final Office Action, pages 4-5. Appellants disagree.

Column 13, lines 12-64, of McKeown et al. is reproduced above. Nowhere in this section, or elsewhere, does McKeown et al. disclose or suggest, for example, transmit logic of a source line card that receives a grant signal and a data cell which are unrelated to each other and transmits the grant signal and the data cell together to the switching fabric, as required by claim 48. Instead, McKeown et al. discloses only that switch core 320 transmits a grant cell (col. 13, lines 33-47).

For at least these reasons, it is respectfully submitted that claim 48 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 48 is respectfully requested.

5. Claim 49.

Dependent claim 49 recites that the source line card further includes transmit logic to receive a request signal and a grant signal which are unrelated to each other from the request generator and the grant generator, respectively, and transmit the request signal and the grant signal together to the switching fabric. Initially, claim 49 depends from claim 45 and is, therefore, not anticipated by McKeown et al. for at least the reasons that claim 45 is not anticipated.

Further, McKeown et al. does not disclose or suggest the combination of features recited

in claim 49. For example, McKeown et al. does not disclose or suggest a source line card that includes transmit logic to receive a request signal and a grant signal which are unrelated to each other from the request generator and the grant generator, respectively, and transmit the request signal and the grant signal together to the switching fabric.

The Examiner alleged that McKeown et al. discloses a source line card (Fig. 3, line card 330a) further includes transmit logic to receive a request signal (Fig. 7) and a grant signal (Fig. 8) which are unrelated (col. 13, lines 23-28 and 49-52) to each other from the request generator and the grant generator, respectively, and transmit the request signal (Fig. 7) and the grant signal (Fig. 8) together to the switching fabric (Fig. 3, switch core 320). Final Office Action, page 5.

Appellants disagree.

Column 13, lines 12-64, of McKeown et al. is reproduced above. Nowhere in this section, or elsewhere, does McKeown et al. disclose or suggest, for example, transmit logic of a source line card that receives a request signal and a grant signal which are unrelated to each other and transmits the request signal and the grant signal together to the switching fabric, as required by claim 49. In fact, McKeown et al. does not disclose or remotely suggest transmitting a request signal and a grant signal together and discloses only that switch core 320 transmits a grant cell (col. 13, lines 33-47).

For at least these reasons, it is respectfully submitted that claim 49 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 49 is respectfully requested.

6. Claim 68.

Independent claim 68 is directed to a line card in a switching device for transferring data

packets, wherein the switching device includes a plurality of line cards. The line card comprises a request generator to generate a request signal to be transmitted to a destination line card in order to receive a grant signal authorizing transferring of data to the destination line card; and a data cell transmitter to provide a data cell to be transmitted to the destination line card upon receipt of the grant signal from the destination line card, where a request signal and a data cell are transmitted together in a single data transfer unit.

McKeown et al. does not disclose or suggest the combination of features recited in claim 68. For example, McKeown et al. does not disclose or suggest a request generator to generate a request signal to be transmitted to a destination line card in order to receive a grant signal authorizing transferring of data to the destination line card.

The Examiner alleged that McKeown et al. discloses these features. Final Office Action, page 5. Appellants respectfully disagree. As explained above, McKeown et al. discloses that line card 330a sends a request cell to switch core 320 (col. 11, lines 37-49). Nowhere does McKeown et al. disclose or suggest that the request cell is sent to a destination line card, as would be required by claim 68.

McKeown et al. also does not disclose or suggest a data cell transmitter to provide a data cell to be transmitted to the destination line card upon receipt of the grant signal from the destination line card, where a request signal and a data cell are transmitted together in a single data transfer unit, as further required by claim 68.

The Examiner alleged that McKeown et al. discloses these features. Final Office Action, page 5. Appellants respectfully disagree. As explained above, McKeown et al. discloses that line card 330a receives a grant cell from switch core 320 (col. 11, lines 37-49). Nowhere does

McKeown et al. disclose or suggest that a grant cell is sent from a destination line card, as would be required by claim 68.

For at least these reasons and reasons similar to those given with regard to claims 44 and 45, it is respectfully submitted that claim 68 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 68 is respectfully requested.

7. Claim 69.

Independent claim 69 is directed to a switching device for transferring data. The switching device comprises a source line card and a destination line card including a grant generator to generate and transmit a grant signal to the source line card to authorize the source line card to transfer data to the destination line card. The source line card includes a data cell transmitter to transfer a data cell to the destination line card upon receiving the grant signal at the source line card. The switching device also comprises a switching fabric coupled to the source line card and the destination line card for receiving the grant signal from the destination line card and switching the grant signal to the source line card, and for receiving the data cell from the source line card and switching the data cell to the destination line card, where the switching fabric is configured to transmit a grant signal and a data cell together in a single data transfer unit.

McKeown et al. does not disclose or suggest the combination of features recited in claim 69. For example, McKeown et al. does not disclose or suggest a destination line card including a grant generator to generate and transmit a grant signal to the source line card to authorize the source line card to transfer data to the destination line card.

The Examiner alleged that McKeown et al. discloses these features. Final Office Action,

page 5. Appellants respectfully disagree. As explained above, McKeown et al. discloses that switch core 320 generates and transmits a grant cell to line card 330a (col. 11, lines 37-49). Nowhere does McKeown et al. disclose or suggest that line card 330z (which the Examiner alleged is equivalent to the destination line card) generates a grant cell or transmits a grant cell to line card 330a (which the Examiner alleged is equivalent to the source line card), as would be required by claim 69.

McKeown et al. also does not disclose or suggest a switching fabric coupled to the source line card and the destination line card for receiving the grant signal from the destination line card and switching the grant signal to the source line card, and for receiving the data cell from the source line card and switching the data cell to the destination line card, where the switching fabric is configured to transmit a grant signal and a data cell together in a single data transfer unit, as further recited in claim 69.

The Examiner alleged that McKeown et al. discloses these features. Final Office Action, pages 5-6. Appellants respectfully disagree. As explained above, McKeown et al. discloses that when an ingress line card 330a has data to send to egress line card 330z, line card 330a sends a request cell to port module 340a of switch core 320 and when port module 340a is ready to receive the data, port module 340a sends a grant cell to line card 330a (col. 11, lines 37-49). Nowhere does McKeown et al. disclose or suggest, for example, that switch core 320 (which the Examiner alleged was equivalent to the switching fabric) receives a grant signal from line card 330z (which the Examiner alleged is equivalent to the destination line card) and switching the grant signal to line card 330a (which the Examiner alleged is equivalent to the source line card), as would be required by claim 69.



McKeown et al. also does not disclose or suggest that the switching fabric is configured to transmit a grant signal from a destination line card and a data cell together in a single data transfer unit, as required by claim 69. The Examiner alleged that McKeown et al. discloses this feature and identified the grant cell shown in Fig. 8 of McKeown et al. for support. Final Office Action, page 6. Appellants respectfully disagree.

McKeown et al. describes that the grant cell shown in Fig. 8 is transmitted strictly between line card 330a and switch core 320 (col. 13, lines 12-64). Nowhere does McKeown et al. disclose or suggest that switch core 320 sends a grant signal from a destination line card to a source line card, let alone transmitting the grant signal and a data cell together in a single data transfer unit, as required by claim 69.

For at least these reasons and reasons similar to those given with regard to claims 44, 45, and 68, it is respectfully submitted that claim 69 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 69 is respectfully requested.

8. Claim 70.

Independent claim 70 is directed to a method for transferring data between line cards in a router, where the router has a plurality of line cards and a switching fabric coupled to the line cards. The method comprises transmitting a request signal from a source line card to a destination line card through the switching fabric; upon receiving the request signal at the destination line card, sending a grant signal from the destination line card to the source line card responsive to the request signal to authorize the source line card to transfer data to the destination line card; transferring a data cell from the source line card to the destination line card in response to the grant signal received at the source line card; and transferring, by the switching fabric, at

least two of a request signal, a grant signal, or a data cell together in a single data transfer unit.

McKeown et al. does not disclose or suggest the combination of features recited in claim 70. For example, McKeown et al. does not disclose or suggest transmitting a request signal from a source line card to a destination line card through the switching fabric.

The Examiner alleged that McKeown et al. discloses these features. Final Office Action, page 6. Appellants respectfully disagree. As explained above, McKeown et al. discloses that line card 330a (which the Examiner alleged is equivalent to the source line card) sends a request cell to switch core 320 (which the Examiner alleged is equivalent to the switching fabric) and receives a grant cell from switch core 320 (col. 11, lines 12-47). Nowhere does McKeown et al. disclose or suggest that switch core 320 transmits a request signal from line card 330a to line card 330z (which the Examiner alleged is equivalent to the destination line card), as would be required by claim 70.

McKeown et al. also does not disclose or suggest that upon receiving the request signal at the destination line card, sending a grant signal from the destination line card to the source line card responsive to the request signal to authorize the source line card to transfer data to the destination line card, as further recited in claim 70.

The Examiner alleged that McKeown et al. discloses these features. Final Office Action, page 6. Appellants respectfully disagree. As explained above, McKeown et al. discloses that switch core 320, not line card 330z, sends a grant cell to line card 330a (col. 11, lines 12-47). Nowhere does McKeown et al. disclose or suggest that line card 330z transmits a grant cell to line card 330a, as would be required by claim 70.

For at least these reasons and reasons similar to those given with regard to claims 44, 45,

68, and 69, it is respectfully submitted that claim 70 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 70 is respectfully requested.

9. Claim 80.

Independent claim 80 is directed to a method for controlling the transfer of data packets through a switching device having a plurality of line cards and a switch fabric therebetween for transferring data packets. The method comprises transferring data packets and flow control together on a same path through the switching device.

McKeown et al. does not disclose or suggest the combination of features recited in claim 80. For example, McKeown et al. does not disclose or suggest transferring data packets and flow control together on a same path through a switching device.

The Examiner alleged that McKeown et al. discloses sending both a request cell and a grant cell together on a same path through the switching device. Final Office Action, pages 6-7. Appellants respectfully disagree.

Appellants submit that the Examiner is not addressing the features of claim 80. Claim 80 does not recite sending a request cell and a grant cell on a same path, but instead recites transferring data packets and flow control together on a same path. Even assuming, for the sake of argument, that the request cell and the grant cell could be equated to data packets and flow control (a point that Appellants do not concede), McKeown et al. discloses that switch core 320 receives a request cell from line card 330a and transmits a grant cell to line card 330a (col. 11, lines 37-49). Nowhere does McKeown et al. disclose or suggest that the request cell or the grant cell are transmitted through switch core 320, as would be required by claim 80.

For at least these reasons, it is respectfully submitted that claim 80 is not anticipated by

McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 80 is respectfully requested.

10. Claim 81.

Independent claim 81 is directed to a method in a switching device having a plurality of line cards and a switching fabric therebetween for transferring data packets, where each line card includes an input section including one or more input ports and an output section including one or more output ports. The method for controlling the transfer of a data packet through the switching device comprises generating a request flow control message at a source line card to request authorization for a transfer of the data packet from the source line card to the destination line card; transferring the request flow control message from the input section of the source line card to the output section of the destination line card using the switching fabric; generating a grant flow control message at a destination line card for the data packet; transferring the grant flow control message from the output section of the destination line card to the input section of the destination line card; transferring the grant flow control message from the input section of the destination line card to the output section of the source line card using the switching fabric; receiving the grant flow control message on the output section of the source line card and transferring the grant flow control message to the input section of the source line card; and upon receipt of the grant flow control message at the input section of the source line card, transferring the data packet from the source line card to the destination line card using the switching fabric.

McKeown et al. does not disclose or suggest the combination of features recited in claim 81. For example, McKeown et al. does not disclose or suggest generating a request flow control message at a source line card to request authorization for a transfer of the data packet from the

source line card to the destination line card.

The Examiner alleged that McKeown et al. discloses these features. Final Office Action, page 7. Appellants respectfully disagree. As explained above, McKeown et al. discloses that line card 330a (which the Examiner alleged is equivalent to the source line card) sends a request cell to switch core 320 (which the Examiner alleged is equivalent to the switching fabric) and receives a grant cell from switch core 320 (col. 11, lines 12-47). Nowhere does McKeown et al. disclose or suggest that line card 330a generates a request cell to request authorization for a transfer of a data packet from line card 330a to line card 330z (which the Examiner alleged is equivalent to the destination line card), as would be required by claim 81.

McKeown et al. also does not disclose or suggest transferring the request flow control message from the input section of the source line card to the output section of the destination line card using the switching fabric, as further recited in claim 81. The Examiner alleged that McKeown et al. discloses these features. Final Office Action, page 7. Appellants respectfully disagree. As explained above, McKeown et al. discloses that line card 330a (which the Examiner alleged is equivalent to the source line card) sends a request cell to switch core 320 (which the Examiner alleged is equivalent to the switching fabric) and receives a grant cell from switch core 320 (col. 11, lines 12-47). Nowhere does McKeown et al. disclose or suggest that line card 330a transfers a request cell to line card 330z (which the Examiner alleged is equivalent to the destination line card) via switch core 320, as would be required by claim 81.

McKeown et al. also does not disclose or suggest generating a grant flow control message at a destination line card for the data packet, as further recited in claim 81. The Examiner alleged that McKeown et al. discloses these features. Final Office Action, page 7. Appellants

respectfully disagree. As explained above, McKeown et al. discloses that switch core 320 (which the Examiner alleged is equivalent to the switching fabric) generates a grant cell (col. 11, lines 12-47), not line card 330z (which the Examiner alleged is equivalent to the destination line card), as would be required by claim 81.

McKeown et al. also does not disclose or suggest transferring the grant flow control message from the input section of the destination line card to the output section of the source line card using the switching fabric, as further recited in claim 81. The Examiner alleged that McKeown et al. discloses these features. Final Office Action, page 7. Appellants respectfully disagree. As explained above, McKeown et al. discloses that line card 330a (which the Examiner alleged is equivalent to the source line card) sends a request cell to switch core 320 (which the Examiner alleged is equivalent to the switching fabric) and receives a grant cell from switch core 320 (col. 11, lines 12-47). Nowhere does McKeown et al. disclose or suggest that line card 330z (which the Examiner alleged is equivalent to the destination line card) transfers a grant cell to line card 330a via switch core 320, as would be required by claim 81.

Because McKeown et al. does not disclose the above-identified features of claim 81, McKeown et al. cannot disclose the remaining features of claim 81 which further involve the grant flow control signal.

For at least these reasons and reasons similar to those given with regard to claims 44, 45, and 68-70, it is respectfully submitted that claim 81 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 81 is respectfully requested.

11. Claim 82.

Independent claim 82 is directed to a method for controlling the transfer of a data packet

through a switching device having a plurality of line cards and a switching fabric therebetween for transferring data packets, where each line card includes an input section including one or more input ports and an output section including one or more output ports. The method comprises generating flow control messages at the source line card and destination line card to authorize a transfer of the data packet from the source line card to the destination line card; and transferring the flow control messages between the source and destination line cards including transferring flow control messages from the input section of a line card to the output section of a different line card using the switching fabric, and transferring flow control messages from the output section of a line card to the input section of a same line card without using the switching fabric.

McKeown et al. does not disclose or suggest the combination of features recited in claim 82. For example, McKeown et al. does not disclose or suggest generating flow control messages at the source line card and destination line card to authorize a transfer of the data packet from the source line card to the destination line card.

The Examiner alleged that McKeown et al. discloses these features. Final Office Action, page 8. Appellants respectfully disagree. As explained above, McKeown et al. discloses that line card 330a (which the Examiner alleged is equivalent to the source line card) sends a request cell to switch core 320 (which the Examiner alleged is equivalent to the switching fabric) and receives a grant cell from switch core 320 (col. 11, lines 12-47). Nowhere does McKeown et al. disclose or suggest that line card 330a and line card 330z (which the Examiner alleged is equivalent to the destination line card) generate a request cell or a grant cell (which the Examiner alleged are equivalent to the flow control messages) to authorize a transfer of a data packet from

the line card 330a to line card 330z, as would be required by claim 82.

McKeown et al. also does not disclose or suggest transferring flow control messages from the input section of a line card to the output section of a different line card using the switching fabric, as further recited in claim 82. The Examiner alleged that McKeown et al. discloses these features. Final Office Action, page 8. Appellants respectfully disagree. As explained above, McKeown et al. discloses that line card 330a sends a request cell to switch core 320 (which the Examiner alleged is equivalent to the switching fabric) and receives a grant cell from switch core 320 (col. 11, lines 12-47). Nowhere does McKeown et al. disclose or suggest that either the request cell or the grant cell (which the Examiner alleged are equivalent to the flow control messages) are transferred from the input section of line card 330a or 330z to the output section of line card 330a or 330z using switch core 320, as would be required by claim 82.

McKeown et al. also does not disclose or suggest transferring flow control messages from the output section of a line card to the input section of a same line card without using the switching fabric, as further recited in claim 82. McKeown et al. does not disclose anything similar to this feature of claim 82. The Examiner generally alleged that McKeown et al. discloses this feature but did not identify any portion of McKeown et al. that supports the Examiner's allegation. Final Office Action, page 8. Therefore, the Examiner did not establish a proper case of anticipation with regard to claim 82.

For at least these reasons and reasons similar to those given with regard to claims 44, 45, 68-70, and 81, it is respectfully submitted that claim 82 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 82 is respectfully requested.

12. Claim 83.



Independent claim 83 is directed to a method for controlling the transfer of a data packet through a switching device having a plurality of line cards and a switching fabric therebetween for transferring data packets. The method comprises generating flow control messages at the source line card and destination line card to authorize a transfer of the data packet from the source line card to the destination line card, each flow control message only including a source and destination line card address; and transferring the flow control messages between the source and destination line cards using the switching fabric where minimal data buffering is performed by the switching fabric in processing the flow control messages.

McKeown et al. does not disclose or suggest the combination of features recited in claim 83. For example, McKeown et al. does not disclose or suggest generating flow control messages at the source line card and destination line card to authorize a transfer of a data packet from the source line card to the destination line card, where each flow control message only includes a source and destination line card address. McKeown et al. does not disclose anything similar to a flow control message that includes only a source and destination line card address. The Examiner generally alleged that McKeown et al. discloses this feature but did not identify any portion of McKeown et al. that supports the Examiner's allegation. Final Office Action, pages 8-9. Therefore, the Examiner did not establish a proper case of anticipation with regard to claim 83.

McKeown et al. also does not disclose or suggest transferring the flow control messages between the source and destination line cards using the switching fabric where minimal data buffering is performed by the switching fabric in processing the flow control messages, as further recited in claim 83. The Examiner alleged that McKeown et al. discloses these features. Final

Office Action, page 9. Appellants respectfully disagree. As explained above, McKeown et al. discloses that line card 330a (which the Examiner alleged is equivalent to the source line card) sends a request cell to switch core 320 (which the Examiner alleged is equivalent to the switching fabric) and receives a grant cell from switch core 320 (col. 11, lines 12-47). Nowhere does McKeown et al. disclose or suggest that either the request cell or the grant cell (which the Examiner alleged are equivalent to the flow control messages) are transferred between line card 330a and line card 330z (which the Examiner alleged is equivalent to the destination line card) using switch core 320, as would be required by claim 83.

For at least these reasons and reasons similar to those given with regard to claims 44, 45, 68-70, 81, and 82, it is respectfully submitted that claim 83 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 83 is respectfully requested.

13. Claim 84.

Dependent claim 84 recites using a probe cell to arbitrate when the data packet will be transferred including transferring the probe cell from the source line card to the destination line card using the switching fabric. Initially, claim 84 depends from claim 82 and is, therefore, not anticipated by McKeown et al. for at least the reasons that claim 82 is not anticipated.

Further, McKeown et al. does not disclose or suggest the combination of features recited in claim 84. For example, McKeown et al. does not disclose or suggest using a probe cell to arbitrate when the data packet will be transferred including transferring the probe cell from the source line card to the destination line card using the switching fabric.

The Examiner generally alleged that McKeown et al. discloses these features but did not identify any portion of McKeown et al. that supports the Examiner's allegation. Final Office

Action, page 9. Therefore, the Examiner did not establish a proper case of anticipation with regard to claim 84.

For at least these reasons, it is respectfully submitted that claim 84 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 84 is respectfully requested.

14. Claim 86.

Independent claim 86 is directed to a switching device for transferring data packets. The switching device comprises one or more source line cards, each including a request generator to generate a request signal to be transmitted in order to obtain an authorization to transmit data; one or more destination line cards, each including a grant generator to generate and send back a grant signal to a source line card in response to the request signal received at the destination line card to authorize the source line card to transmit a data cell to the destination line card; and a plurality of planes of switching elements coupling the one or more source line cards and the one or more destination line cards, each plane being connected to the one or more source line cards and the one or more destination line cards and being configured to receive and transmit the request signal, the grant signal, and the data cell to the appropriate line cards.

McKeown et al. does not disclose or suggest the combination of features recited in claim 86. For example, McKeown et al. does not disclose or suggest one or more destination line cards, each including a grant generator to generate and send back a grant signal to a source line card in response to the request signal received at the destination line card to authorize the source line card to transmit a data cell to the destination line card.

The Examiner alleged that McKeown et al. discloses one or more destination line cards

(Fig. 3, line card 330z), each including a grant generator to generate and send back a grant signal (Fig. 8) to a source line card (Fig. 3, line card 330a) in response to the request signal (Fig. 7) received at a destination line card (Fig. 3, line card 330z) to authorize the source line card (Fig. 3, line card 330a) to transmit a data cell to the destination line card (Fig. 3, line card 330z). Final Office Action, page 9. Appellants respectfully disagree.

At column 11, lines 37-49, McKeown et al. discloses that when an ingress line card 330a has data to send to egress line card 330z, line card 330a sends a request cell to port module 340a of switch core 320 and when port module 340a is ready to receive the data, port module 340a sends a grant cell to line card 330a. Nowhere does McKeown et al. disclose or suggest that egress line card 330z generates and sends back a grant signal to source line card 330a in response to the request signal received at destination line card 330z to authorize source line card 330a to transmit a data cell to destination line card 330z, as would be required by claim 86. Instead, as explained above, McKeown et al. discloses that switch core 320, not destination line card 330z, generates and sends a grant cell to line card 330a.

McKeown et al. also does not disclose or suggest a plurality of planes of switching elements coupling the one or more source line cards and the one or more destination line cards, each plane being connected to the one or more source line cards and the one or more destination line cards and being configured to receive and transmit the request signal, the grant signal, and the data cell to the appropriate line cards, as further recited in claim 86. The Examiner generally alleged that McKeown et al. discloses a plurality of planes of switching elements and identified the entire McKeown et al. patent for support. Final Office Action, pages 9-10. McKeown et al. discloses that switch core 320 includes a plurality of port modules 340, a parallel sliced self-

routing crossbar fabric module 350, and a centralized scheduler module 360 (col. 4, lines 49-52).

Contrary to the Examiner's allegation, McKeown et al. does not disclose or remotely suggest a plurality of planes of switching elements, as required by claim 86.

For at least these reasons and reasons similar to those given with regard to claims 44, 45, 68-70, and 81-83, it is respectfully submitted that claim 86 is not anticipated by McKeown et al. under 35 U.S.C. § 102. Reversal of the rejection of claim 86 is respectfully requested.

**C. Rejection Under 35 U.S.C. § 103(a) Over McKeown et al. (U.S. Patent No. 6,647,019) in View of Stevens (U.S. Patent No. 5,463,486).**

The initial burden of establishing a prima facie basis to deny patentability to a claimed invention is always upon the Examiner. In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In rejecting a claim under 35 U.S.C. § 103, the Examiner must provide a factual basis to support the conclusion of obviousness. In re Warner, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967). Based upon the objective evidence of record, the Examiner is required to make the factual inquiries mandated by Graham v. John Deere Co., 86 S.Ct. 684, 383 U.S. 1, 148 USPQ 459 (1966). The Examiner is also required to explain how and why one having ordinary skill in the art would have been led to modify an applied reference and/or combine applied references to arrive at the claimed invention. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

In establishing motivation, it has been consistently held that the requisite motivation to support the conclusion of obviousness is not an abstract concept, but must stem from the prior art as a whole to impel one having ordinary skill in the art to modify a reference or combine

references with a reasonable expectation of successfully achieving some particular realistic objective. See, for example, Interconnect Planning Corp. v. Feil, 227 F.2d 1132, 227 USPQ 543 (Fed. Cir. 1985).

1. Claim 51.

Dependent claim 51 recites that the switching fabric includes a plurality of first stage crossbars, each first stage crossbar having a plurality of input ports and a plurality of output ports, wherein each of the input ports of the first stage crossbar is connected to a different source line card; a plurality of second stage crossbars, each second stage crossbar having a plurality of input ports and a plurality of output ports, wherein an output port of the first stage crossbar is connected to an input port of the second stage crossbar; and a plurality of third stage crossbars, each third stage crossbar having a plurality of input ports and a plurality of output ports, wherein an output port of the second stage crossbar is connected to an input port of the third stage crossbar, wherein each of the output ports of the third stage crossbars are connected to a different destination line card.

Initially, claim 51 depends from claim 45. The disclosure of Stevens does not cure the deficiencies in the disclosure of McKeown et al. identified above with regard to claim 45. Therefore, claim 51 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 45.

For at least these reasons, it is respectfully submitted that claim 51 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 51 is respectfully requested.

2. Claim 52.

Dependent claim 52 recites that each of the first, second and third stage crossbars includes a plurality of request spray engines, each request spray engine associated with one of the input ports of the crossbars, each request spray engine receiving the request signal and spraying the request signal to one of the output ports in the same crossbar to which the request spray engine is associated.

Claim 52 depends from claim 45. The disclosure of Stevens does not cure the deficiencies in the disclosure of McKeown et al. identified above with regard to claim 45. Therefore, claim 52 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 45.

For at least these reasons, it is respectfully submitted that claim 52 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 52 is respectfully requested.

3. Claim 54.

Dependent claim 54 recites that each of the first, second, and third stage crossbars further includes a plurality of grant spray engines, each grant spray engine associated with one of the input ports of the crossbars, each grant spray engine receiving the grant signal and spraying the grant signal to one of the output ports in the crossbar to which the request spray engine is associated.

Claim 54 depends from claim 45. The disclosure of Stevens does not cure the deficiencies in the disclosure of McKeown et al. identified above with regard to claim 45. Therefore, claim 54 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 45.

In addition, neither McKeown et al. nor Stevens discloses or suggests each of first, second, and third stage crossbars that include a plurality of grant spray engines. The Examiner admitted that McKeown et al. does not disclose this feature. Final Office Action, page 11. The Examiner alleged, however, that Stevens discloses a plurality of grant spray engines (Fig. 3, switch 70). Final Office Action, page 14. Appellants disagree.

Stevens does not disclose or suggest grant signals. Therefore, contrary to the Examiner's allegation, Stevens cannot disclose a plurality of grant spray engines that receive and spray grant signals, as required by claim 54.

For at least these reasons, it is respectfully submitted that claim 54 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 54 is respectfully requested.

4. Claim 56.

Dependent claim 56 recites that each of the first, second and third stage crossbars further includes a plurality of data cell spray engines, each data cell spray engine associated with one of the input ports of the crossbars, each data cell spray engine receiving the data cell and spraying the data cell to one of the output ports in the crossbar to which the data cell spray engine is associated.

Claim 56 depends from claim 45. The disclosure of Stevens does not cure the deficiencies in the disclosure of McKeown et al. identified above with regard to claim 45. Therefore, claim 56 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 45.

For at least these reasons, it is respectfully submitted that claim 56 is patentable over



McKeown et al. and Stevens, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 56 is respectfully requested.

5. Claim 58.

Dependent claim 58 recites each of the first, second and third stage crossbars includes a plurality of request handlers, each request handler associated with one of the output ports of the crossbars, each request handler receiving the request signal sprayed by any one of the request spray engines in the crossbar to which the request handler is associated.

Claim 58 depends from claim 45. The disclosure of Stevens does not cure the deficiencies in the disclosure of McKeown et al. identified above with regard to claim 45. Therefore, claim 58 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 45.

For at least these reasons, it is respectfully submitted that claim 58 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 58 is respectfully requested.

6. Claim 66.

Dependent claim 66 recites that the first, second and third stage crossbars further include a plurality of grant handlers, each grant handler associated with one of the output ports of a crossbar, each grant handler receiving a grant signal sprayed by any one of the grant spray engines in a same crossbar to which the grant handler is associated; and a plurality of data cell handlers, each data cell handler associated with one of the output ports of a crossbar, each data cell handler receiving a data cell sprayed by any one of the data cell spray engines in a same crossbar to which the data cell handler is associated.

Claim 66 depends from claim 45. The disclosure of Stevens does not cure the deficiencies in the disclosure of McKeown et al. identified above with regard to claim 45. Therefore, claim 66 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 45.

In addition, neither McKeown et al. nor Stevens discloses or suggests, for example, first, second and third stage crossbars that include a plurality of grant handlers, each grant handler associated with one of the output ports of a crossbar, each grant handler receiving a grant signal sprayed by any one of the grant spray engines in a same crossbar to which the grant handler is associated. The Examiner admitted that McKeown et al. does not disclose these features. Final Office Action, pages 11-12. The Examiner alleged, however, that Stevens discloses a plurality of grant handlers. Final Office Action, page 15. Appellants disagree.

Stevens does not disclose or suggest grant signals. Therefore, contrary to the Examiner's allegation, Stevens cannot disclose a plurality of grant handlers that receive grant signals, as required by claim 66.

For at least these reasons, it is respectfully submitted that claim 66 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 66 is respectfully requested.

7. Claim 67.

Independent claim 67 is directed to a switch fabric in a switching device having a plurality of line cards and a switch fabric therebetween for transferring data packets. The switch fabric comprises a plurality of first stage crossbars in a first stage, each first stage crossbar having a plurality of input ports and a plurality of output ports, each input port having a first request

spray engine to receive a plurality of request signals associated with a destination line card and spray the request signals to different ones of the output ports in the same first stage crossbar; a plurality of second stage crossbars in a second stage, each second stage crossbar having a plurality of input ports and a plurality of output ports, each input port having a second request spray engine to receive one of the request signals from one of the first stage crossbars and send the request signal to one of the output ports in the same second stage crossbar; and a plurality of third stage crossbars in a third stage, each third stage crossbar having a plurality of input ports and a plurality of output ports, each input port having a third request spray engine to receive one of the request signals from one of the second stage crossbars and send the request signal to one of the output ports in the same third stage crossbar.

Neither McKeown et al. nor Stevens, whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 67. For example, neither McKeown et al. nor Stevens discloses or suggests a switch fabric that comprises, among other things, a plurality of first stage crossbars in a first stage, where each first stage crossbar has a plurality of input ports and a plurality of output ports, and each input port has a first request spray engine to receive a plurality of request signals associated with a destination line card and spray the request signals to different ones of the output ports in the same first stage crossbar.

The Examiner admitted that McKeown et al. does not disclose or suggests these features. Final Office Action, page 12. The Examiner alleged, however, that Stevens discloses these features. Final Office Action, pages 15-16. Appellants respectfully disagree.

Stevens does not disclose or suggest each input port of a first stage crossbar that has a first request spray engine to receive a plurality of request signals associated with a destination

line card and spray the request signals to different ones of the output ports in the same first stage crossbar, as required by claim 67. The Examiner did not specifically address this feature. Therefore, the Examiner did not establish a prima facie case of obviousness with regard to claim 67.

For at least these reasons, it is respectfully submitted that claim 67 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 67 is respectfully requested.

8. Claim 73.

Dependent claim 73 recites that the switching fabric is in a three-stage Clos topology having a plurality of first stage crossbars in a first stage, a plurality of second stage crossbars in a second stage and a plurality of third stage crossbars in a third stage. The method further comprises transmitting the request signal from the source line card to one of the first stage crossbars; selecting one of the second stage crossbars to switch the request signal; switching the request signal to the selected second stage crossbar; determining which one of the third stage crossbars to direct the request signal according to the destination line card to where the request signal is to be sent; directing the request signal to the determined third stage crossbar; determining which one of the line cards coupled to the determined crossbar to transfer the request signal; and transferring the request signal to the determined line card.

Claim 73 depends from claim 70. The disclosure of Stevens does not cure the deficiencies in the disclosure of McKeown et al. identified above with regard to claim 70. Therefore, claim 73 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 70.

For at least these reasons, it is respectfully submitted that claim 73 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 73 is respectfully requested.

9. Claim 78.

Dependent claim 78 recites that the switching fabric is in a three-stage Clos topology, a plurality of first stage crossbars in a first stage, a plurality of second stage crossbars in a second stage and a plurality of third stage crossbars in a third stage, wherein transferring the data cell from the source line card to the destination line card further comprises transmitting the data cell from the source line card to one of the first stage crossbars; selecting one of the second stage crossbars to where the data cell is to be switched; switching the data cell to the selected second stage crossbar; determining which one of the third stage crossbars to direct the data cell according to the destination line card to where the data cell is to be sent; directing the data cell to the determined third stage crossbar; determining which one of the line cards coupled to the determined third stage crossbar to transfer the data cell according to the destination line card to where the data cell is to be sent; and transferring the data cell to the determined line card.

Claim 78 depends from claim 70. The disclosure of Stevens does not cure the deficiencies in the disclosure of McKeown et al. identified above with regard to claim 70. Therefore, claim 78 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 70.

For at least these reasons, it is respectfully submitted that claim 78 is patentable over McKeown et al. and Stevens, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 78 is respectfully requested.

**D. Rejection Under 35 U.S.C. § 103(a) Over McKeown et al. (U.S. Patent No. 6,647,019) in View of Cisneros (U.S. Patent No. 5,157,654).**

As stated above, the initial burden of establishing a prima facie basis to deny patentability to a claimed invention is always upon the Examiner. In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In rejecting a claim under 35 U.S.C. § 103, the Examiner must provide a factual basis to support the conclusion of obviousness. In re Warner, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967). Based upon the objective evidence of record, the Examiner is required to make the factual inquiries mandated by Graham v. John Deere Co., 86 S.Ct. 684, 383 U.S. 1, 148 USPQ 459 (1966). The Examiner is also required to explain how and why one having ordinary skill in the art would have been led to modify an applied reference and/or combine applied references to arrive at the claimed invention. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

In establishing motivation, it has been consistently held that the requisite motivation to support the conclusion of obviousness is not an abstract concept, but must stem from the prior art as a whole to impel one having ordinary skill in the art to modify a reference or combine references with a reasonable expectation of successfully achieving some particular realistic objective. See, for example, Interconnect Planning Corp. v. Feil, 227 F.2d 1132, 227 USPQ 543 (Fed. Cir. 1985).

1. Claim 50.

Dependent claim 50 recites that the switching fabric includes a plurality of planes, each plane being coupled to the source line card and the destination line card to receive and switch the

request signal, the grant signal and the data cell to an appropriate one of the source line card or the destination line card.

Initially, claim 50 depends from claim 45. The disclosure of Cisneros does not cure the deficiencies in the disclosure of McKeown et al. identified above with regard to claim 45. Claim 50 is, therefore, patentable over McKeown et al. and Cisneros, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 45.

Further, neither McKeown et al. nor Cisneros, whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 50. For example, neither McKeown et al. nor Cisneros discloses or suggests a switching fabric that includes a plurality of planes, each plane being coupled to the source line card and the destination line card to receive and switch the request signal, the grant signal and the data cell to an appropriate one of the source line card or the destination line card.

The Examiner admitted that McKeown et al. does not disclose these features. Final Office Action, page 18. The Examiner alleged, however, that Cisneros discloses the features. Final Office Action, page 19. Appellants disagree.

Cisneros does not disclose or suggest each plane of a switching fabric that receives and switches a request signal, grant signal, and data cell to an appropriate one of a source line card or a destination line card, as required by claim 50. In fact, Cisneros does not even mention, for example, a grant signal. McKeown et al. discloses a grant cell, but does not disclose or suggest a switching fabric that receives and switches the grant cell to an appropriate one of a source line card or a destination line card. Therefore, even if the disclosures of McKeown et al. and Cisneros could be combined (a point that Appellants do not concede), the combined system

would not include a switching fabric that includes a plurality of planes, each plane being coupled to the source line card and the destination line card to receive and switch the request signal, the grant signal and the data cell to an appropriate one of the source line card or the destination line card, as required by claim 50.

For at least these reasons, it is respectfully submitted that claim 50 is patentable over McKeown et al. and Cisneros, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 50 is respectfully requested.

2. Claim 71.

Dependent claim 71 recites that the switching fabric includes a plurality of planes, and that the method further comprises transmitting the request signal to one of the planes; and sending the grant signal from the destination line card to the source line card in response to the request signal received at the destination line card from one of the planes.

Initially, claim 71 depends from claim 70. The disclosure of Cisneros does not cure the deficiencies in the disclosure of McKeown et al. identified above with regard to claim 70. Claim 71 is, therefore, patentable over McKeown et al. and Cisneros, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 71.

Further, neither McKeown et al. nor Cisneros, whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 71. For example, neither McKeown et al. nor Cisneros discloses or suggests sending a grant signal from the destination line card to the source line card in response to the request signal received at the destination line card from one of a plurality of planes.

The Examiner admitted that McKeown et al. does not disclose this feature. Final Office



Action, page 18. The Examiner alleged, however, that Cisneros discloses the feature. Final Office Action, page 19. Appellants disagree.

Cisneros does not even mention a grant signal. Therefore, Cisneros cannot disclose or suggest sending a grant signal from the destination line card to the source line card in response to the request signal received at the destination line card from one of the planes, as required by claim 71. McKeown et al. discloses a grant cell, but does not disclose or suggest sending the grant cell from a destination line card to a source line card in response to a request signal received at the destination line card from one of the planes, as required by claim 71. Therefore, even if the disclosures of McKeown et al. and Cisneros could be combined (a point that Appellants do not concede), the combined system would not, for example, send a grant signal from a destination line card to a source line card in response to a request signal received at the destination line card from one of the planes of the switching fabric, as required by claim 71.

For at least these reasons, it is respectfully submitted that claim 71 is patentable over McKeown et al. and Cisneros, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 71 is respectfully requested.

### 3. Claim 72.

Dependent claim 72 recites sending the grant signal from the destination line card to the same plane from which the request signal arrived.

Initially, claim 72 depends from claim 70. The disclosure of Cisneros does not cure the deficiencies in the disclosure of McKeown et al. identified above with regard to claim 70. Claim 72 is, therefore, patentable over McKeown et al. and Cisneros, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 70. Claim 72 also

depends from claim 71 and is, therefore, patentable over McKeown et al. and Cisneros, whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 71.

Further, neither McKeown et al. nor Cisneros, whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 72. For example, neither McKeown et al. nor Cisneros discloses or suggests sending a grant signal from the destination line card to the same plane from which the request signal arrived.

The Examiner admitted that McKeown et al. does not disclose these features. Final Office Action, page 18. The Examiner alleged, however, that Cisneros discloses the features. Final Office Action, page 19. Appellants disagree.

Cisneros does not even mention a grant signal. Therefore, Cisneros cannot disclose or suggest sending a grant signal from the destination line card to the same plane from which the request signal arrived, as required by claim 72. Therefore, even if the disclosures of McKeown et al. and Cisneros could be combined (a point that Appellants do not concede), the combined system would not send a grant signal from the destination line card to the same plane from which the request signal arrived, as required by claim 72.

For at least these reasons, it is respectfully submitted that claim 72 is patentable over McKeown et al. and Cisneros, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 72 is respectfully requested.

4. Claim 87.

Independent claim 87 is directed to a method for recovering from a failure in a switching device including one or more source line cards and destination line cards, where the switching

device transfers data packets through a network. The method comprises providing plural switching planes between each source line card and destination line card; generating flow control messages for authorizing a transfer of a packet from a source line card to a destination line card; spraying the flow control messages over each of the plural switching planes; and spraying data packets over switching planes on which flow control authorization messages are received.

Neither McKeown et al. nor Cisneros, whether taken alone or in any reasonable combination, discloses or suggests the combination of features recited in claim 87. For example, neither McKeown et al. nor Cisneros discloses or suggests spraying flow control messages over each of a plurality of switching planes or spraying data packets over switching planes on which flow control authorization messages are received.

The Examiner admitted that McKeown et al. does not disclose or suggests these features. Final Office Action, page 18. The Examiner alleged, however, that Cisneros discloses these features. Final Office Action, pages 19-20. Appellants respectfully disagree.

Cisneros does not disclose or suggest anything similar to spraying flow control messages over each of a plurality of switching planes or spraying data packets over switching planes on which flow control authorization messages are received, as required by claim 87. The Examiner did not specifically address these features. Therefore, the Examiner did not establish a prima facie case of obviousness with regard to claim 87.

For at least these reasons, it is respectfully submitted that claim 87 is patentable over McKeown et al. and Cisneros, whether taken alone or in any reasonable combination, under 35 U.S.C. § 103. Reversal of the rejection of claim 87 is respectfully requested.

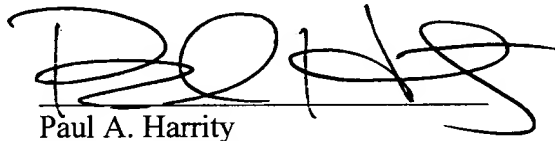
VIII. CONCLUSION

In view of the foregoing arguments, Appellants respectfully solicits the Honorable Board to reverse the Examiner's rejections of claims 44-52, 54, 56, 58, 66-73, 78, 80-84, 86, and 87 under 35 U.S.C. §§ 112, 102, and 103.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

HARRITY SNYDER, L.L.P.

A handwritten signature in black ink, appearing to read 'Paul A. Harrity', written over a horizontal line.

Paul A. Harrity  
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CLAIM APPENDIX

44. In a system for transferring data packets, where the system includes a plurality of line cards, a line card comprising:

a request generator to generate a request signal to be transmitted to a destination line card in order to receive a grant signal authorizing transferring of data to the destination line card;

a data cell transmitter to transmit a data cell to the destination line card upon receipt of the grant signal from the destination line card; and

transmit logic to receive a grant signal and a data cell which are unrelated to each other from a grant generator and the data cell transmitter, respectively, and transmit the grant signal and the data cell together in a data transfer unit.

45. A switching device for transferring data packets, comprising:

one or more source line cards, each including a request generator to generate a request signal to be transmitted in order to obtain an authorization to transmit data;

one or more destination line cards, each including a grant generator to generate and send back a grant signal to a source line card in response to the request signal received at a destination line card to authorize the source line card to transmit a data cell to the destination line card; and

a switching fabric coupled to the source line card and the destination line card, the switching fabric being configured to receive and transmit the request signal, the grant signal, and the data cell to the appropriate line cards, where the switching fabric is configured to transmit at least two of a request signal, a grant signal, or a data cell together in a single data transfer unit.

46. The switching device of claim 45, wherein the source line card further includes a data cell transmitter to transmit the data cell upon receiving the grant signal from the destination line card.

47. The switching device of claim 46, wherein the source line card further includes transmit logic to receive a request signal and a data cell which are unrelated to each other from the request generator and the data cell transmitter, respectively, and transmit the request signal and the data cell together to the switching fabric.

48. The switching device of claim 46, wherein the source line card further includes transmit logic to receive a grant signal and a data cell which are unrelated to each other from the grant generator and the data cell transmitter, respectively, and transmit the grant signal and the data cell together to the switching fabric.

49. The switching device of claim 45, wherein the source line card further includes transmit logic to receive a request signal and a grant signal which are unrelated to each other from the request generator and the grant generator, respectively, and transmit the request signal and the grant signal together to the switching fabric.

50. The switching device of claim 45, wherein the switching fabric includes a plurality of planes, each plane being coupled to the source line card and the destination line card to receive and switch the request signal, the grant signal and the data cell to an appropriate one of

the source line card or the destination line card.

51. The switching device of claim 45, wherein the switching fabric further includes:  
a plurality of first stage crossbars, each first stage crossbar having a plurality of input ports and a plurality of output ports, wherein each of the input ports of the first stage crossbar is connected to a different source line card;

a plurality of second stage crossbars, each second stage crossbar having a plurality of input ports and a plurality of output ports, wherein an output port of the first stage crossbar is connected to an input port of the second stage crossbar; and

a plurality of third stage crossbars, each third stage crossbar having a plurality of input ports and a plurality of output ports, wherein an output port of the second stage crossbar is connected to an input port of the third stage crossbar, wherein each of the output ports of the third stage crossbars are connected to a different destination line card.

52. The switching device of claim 51, wherein each of the first, second and third stage crossbars includes a plurality of request spray engines, each request spray engine associated with one of the input ports of the crossbars, each request spray engine receiving the request signal and spraying the request signal to one of the output ports in the same crossbar to which the request spray engine is associated.

54. The switching device of claim 51, wherein each of the first, second and third stage crossbars further includes:

a plurality of grant spray engines, each grant spray engine associated with one of the input ports of the crossbars, each grant spray engine receiving the grant signal and spraying the grant signal to one of the output ports in the crossbar to which the request spray engine is associated.

56. The switching device of claim 51, wherein each of the first, second and third stage crossbars further includes:

a plurality of data cell spray engines, each data cell spray engine associated with one of the input ports of the crossbars, each data cell spray engine receiving the data cell and spraying the data cell to one of the output ports in the crossbar to which the data cell spray engine is associated.

58. The switching device of claim 52, wherein each of the first, second and third stage crossbars includes a plurality of request handlers, each request handler associated with one of the output ports of the crossbars, each request handler receiving the request signal sprayed by any one of the request spray engines in the crossbar to which the request handler is associated.

66. The switching device of claim 51, wherein the first, second and third stage crossbars further includes:

a plurality of grant handlers, each grant handler associated with one of the output ports of a crossbar, each grant handler receiving a grant signal sprayed by any one of the grant spray engines in a same crossbar to which the grant handler is associated; and

a plurality of data cell handlers, each data cell handler associated with one of the output



ports of a crossbar, each data cell handler receiving a data cell sprayed by any one of the data cell spray engines in a same crossbar to which the data cell handler is associated.

67. In a switching device having a plurality of line cards and a switch fabric therebetween for transferring data packets, a switch fabric comprising:

a plurality of first stage crossbars in a first stage, each first stage crossbar having a plurality of input ports and a plurality of output ports, each input port having a first request spray engine to receive a plurality of request signals associated with a destination line card and spray the request signals to different ones of the output ports in the same first stage crossbar;

a plurality of second stage crossbars in a second stage, each second stage crossbar having a plurality of input ports and a plurality of output ports, each input port having a second request spray engine to receive one of the request signals from one of the first stage crossbars and send the request signal to one of the output ports in the same second stage crossbar; and

a plurality of third stage crossbars in a third stage, each third stage crossbar having a plurality of input ports and a plurality of output ports, each input port having a third request spray engine to receive one of the request signals from one of the second stage crossbars and send the request signal to one of the output ports in the same third stage crossbar.

68. In a switching device for transferring data packets wherein the switching device includes a plurality of line cards, a line card comprising:

a request generator to generate a request signal to be transmitted to a destination line card in order to receive a grant signal authorizing transferring of data to the destination line card; and

a data cell transmitter to provide a data cell to be transmitted to the destination line card upon receipt of the grant signal from the destination line card, where a request signal and a data cell are transmitted together in a single data transfer unit.

69. A switching device for transferring data, comprising:

a source line card;

a destination line card including a grant generator to generate and transmit a grant signal to the source line card to authorize the source line card to transfer data to the destination line card;

the source line card including a data cell transmitter to transfer a data cell to the destination line card upon receiving the grant signal at the source line card; and

a switching fabric coupled to the source line card and the destination line card for receiving the grant signal from the destination line card and switching the grant signal to the source line card, and for receiving the data cell from the source line card and switching the data cell to the destination line card, where the switching fabric is configured to transmit a grant signal and a data cell together in a single data transfer unit.

70. A method for transferring data between line cards in a router, the router having a plurality of line cards and a switching fabric coupled to the line cards, the method comprising:

transmitting a request signal from a source line card to a destination line card through the switching fabric;

upon receiving the request signal at the destination line card, sending a grant signal from

the destination line card to the source line card responsive to the request signal to authorize the source line card to transfer data to the destination line card;

transferring a data cell from the source line card to the destination line card in response to the grant signal received at the source line card; and

transferring, by the switching fabric, at least two of a request signal, a grant signal, or a data cell together in a single data transfer unit.

71. The method of claim 70, wherein the switching fabric includes a plurality of planes, the method further comprising:

transmitting the request signal to one of the planes; and

sending the grant signal from the destination line card to the source line card in response to the request signal received at the destination line card from one of the planes.

72. The method of claim 71, further comprising:

sending the grant signal from the destination line card to the same plane from which the request signal arrived.

73. The method of claim 70, wherein the switching fabric is in a three-stage Clos topology having a plurality of first stage crossbars in a first stage, a plurality of second stage crossbars in a second stage and a plurality of third stage crossbars in a third stage, the method further comprising:

transmitting the request signal from the source line card to one of the first stage crossbars;

selecting one of the second stage crossbars to switch the request signal;  
switching the request signal to the selected second stage crossbar;  
determining which one of the third stage crossbars to direct the request signal according to the destination line card to where the request signal is to be sent;  
directing the request signal to the determined third stage crossbar;  
determining which one of the line cards coupled to the determined crossbar to transfer the request signal; and  
transferring the request signal to the determined line card.

78. The method of claim 70, wherein the switching fabric is in a three-stage Clos topology, a plurality of first stage crossbars in a first stage, a plurality of second stage crossbars in a second stage and a plurality of third stage crossbars in a third stage, wherein transferring the data cell from the source line card to the destination line card further comprises:

transmitting the data cell from the source line card to one of the first stage crossbars;  
selecting one of the second stage crossbars to where the data cell is to be switched;  
switching the data cell to the selected second stage crossbar;  
determining which one of the third stage crossbars to direct the data cell according to the destination line card to where the data cell is to be sent;  
directing the data cell to the determined third stage crossbar;  
determining which one of the line cards coupled to the determined third stage crossbar to transfer the data cell according to the destination line card to where the data cell is to be sent; and  
transferring the data cell to the determined line card.

80. In a switching device having a plurality of line cards and a switch fabric therebetween for transferring data packets, a method for controlling the transfer of data packets through the switching device comprising:

transferring data packets and flow control together on a same path through the switching device.

81. In a switching device having a plurality of line cards and a switching fabric therebetween for transferring data packets, where each line card includes an input section including one or more input ports and an output section including one or more output ports, a method for controlling the transfer of a data packet through the switching device comprising:

generating a request flow control message at a source line card to request authorization for a transfer of the data packet from the source line card to the destination line card;

transferring the request flow control message from the input section of the source line card to the output section of the destination line card using the switching fabric;

generating a grant flow control message at a destination line card for the data packet;

transferring the grant flow control message from the output section of the destination line card to the input section of the destination line card;

transferring the grant flow control message from the input section of the destination line card to the output section of the source line card using the switching fabric;

receiving the grant flow control message on the output section of the source line card and transferring the grant flow control message to the input section of the source line card; and

upon receipt of the grant flow control message at the input section of the source line card, transferring the data packet from the source line card to the destination line card using the switching fabric.

82. In a switching device having a plurality of line cards and a switching fabric therebetween for transferring data packets, where each line card includes an input section including one or more input ports and an output section including one or more output ports, a method for controlling the transfer of a data packet through the switching device comprising:

- generating flow control messages at the source line card and destination line card to authorize a transfer of the data packet from the source line card to the destination line card; and
- transferring the flow control messages between the source and destination line cards including
  - transferring flow control messages from the input section of a line card to the output section of a different line card using the switching fabric, and
  - transferring flow control messages from the output section of a line card to the input section of a same line card without using the switching fabric.

83. In a switching device having a plurality of line cards and a switching fabric therebetween for transferring data packets, a method for controlling the transfer of a data packet through the switching device comprising:

- generating flow control messages at the source line card and destination line card to authorize a transfer of the data packet from the source line card to the destination line card, each

flow control message only including a source and destination line card address; and

transferring the flow control messages between the source and destination line cards using the switching fabric where minimal data buffering is performed by the switching fabric in processing the flow control messages.

84. The method of claim 82, further comprising:

using a probe cell to arbitrate when the data packet will be transferred including transferring the probe cell from the source line card to the destination line card using the switching fabric.

86. A switching device for transferring data packets, comprising:

one or more source line cards, each including a request generator to generate a request signal to be transmitted in order to obtain an authorization to transmit data;

one or more destination line cards, each including a grant generator to generate and send back a grant signal to a source line card in response to the request signal received at the destination line card to authorize the source line card to transmit a data cell to the destination line card; and

a plurality of planes of switching elements coupling the one or more source line cards and the one or more destination line cards, each plane being connected to the one or more source line cards and the one or more destination line cards and being configured to receive and transmit the request signal, the grant signal, and the data cell to the appropriate line cards.

87. In a switching device including one or more source line cards and destination line cards, the switching device for transferring data packets through a network, a method for recovering from a failure in the switching device comprising:

- providing plural switching planes between each source line card and destination line card;
- generating flow control messages for authorizing a transfer of a packet from a source line card to a destination line card;
- spraying the flow control messages over each of the plural switching planes; and
- spraying data packets over switching planes on which flow control authorization messages are received.



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EVIDENCE APPENDIX

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RELATED PROCEEDINGS APPENDIX

None